



GUJARAT TECHNOLOGICAL UNIVERSITY

Program Name: Bachelor of Vocation

Level: Under Graduate

Branch: Food Processing and Quality Control

Subject Code: BV02009011

Subject Name: Processing of Fruits and Vegetables

w. e. f. Academic Year:	2024-25
Semester:	2
Category of the Course:	Core Courses

Prerequisite:	NA
Rationale:	The course is designed to provide students with comprehensive knowledge of the post-harvest processing of fruits and vegetables, emphasizing techniques to minimize losses and enhance shelf life. It covers the chemical and nutritional aspects, preparation for processing, and the use of advanced machinery. By exploring standards and specifications for products like jams, jellies, ketchup, and juices, students are equipped with industry-relevant skills, including packaging, microbial analysis, and documentation. This foundational understanding is crucial for careers in the fruits and vegetables processing sector, which has significant scope in India's food industry.

Course Outcome:

After Completion of the Course, Student will able to:

No	Course Outcomes
01	Apply knowledge of processing of fruits and vegetables.
02	Assess the nutritional impact of various fruits and vegetables.
03	Implement quality control measures to ensure food safety and quality.
04	Understand and apply food safety regulations and standards.

Teaching and Examination Scheme:

Teaching Scheme (in Hours)			Total Credits L+T+ (PR/2)	Assessment Pattern and Marks				Total Marks
L	T	PR	C	Theory		Tutorial / Practical		
				ESE (E)	PA / CA (M)	PA/CA (I)	ESE (V)	
3	0	0	3	50	0	0	0	50



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Course Content:

Unit No.	Content	No. of Hours	% of Weightage
1.	<ul style="list-style-type: none">Definition of fruits and vegetablesVarious subsectors of food processing industry, status and scope of fruits and vegetables processing industry in India	7	18
2.	<ul style="list-style-type: none">Post-harvest losses of fruits and vegetables and factors affecting them,Post-harvest changes in fruits and vegetables, maturity indices of fruits and vegetablesClimacteric and non-climacteric fruits, fruit ripening and changes, packaging of whole fruits and vegetablesPost-harvest physical and chemical treatment to enhance the shelf life of fruits and vegetables, microbiological spoilage of fruits and vegetables.	8	18
3.	<ul style="list-style-type: none">Classification, chemical composition and nutritive value of fruits and vegetablesPreparing fruits and vegetables for processing- washing, sorting, grading, peeling, Bottling and canning of fruits and vegetables	7	15
4.	<ul style="list-style-type: none">Machineries for peeling, slicing/dicing, pulping, hydraulic pressing and clarificationPreparation and maintenance of work area and process machineriesDifferent materials and equipment's used in the cleaning process	7	15
5.	<ul style="list-style-type: none">FPO specifications and preparations of Jam, Jellies, marmalade, pickles Tomato processing- FPO standard and preparation of tomato juice, puree, paste, chutney, sauce and ketchup.Preparation and standard of fruit juices, squashes, cordials, fruit syrup, nectar, RTS and pulp	8	17
6.	<ul style="list-style-type: none">Job role and responsibilities of jam, jelly and ketchup processing technician, hierarchy role and organizational structurePackaging of jam, jelly and ketchup; microbial spoilage; microbial; analysis of products; documentation procedure and	8	17



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	maintenance of record of raw materials, packing materials, finished products		
	Total	45	100

Suggested Specification Table with Marks (Theory):

Distribution of Theory Marks					
R Level	U Level	A Level	N Level	E Level	C Level
25	20	15	10	15	15

Where R: Remember; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create (as per Revised Bloom's Taxonomy)

References/Suggested Learning Resources:

(a) Books:

1. Post-harvest physiology, handling and utilization of tropical and subtropical fruits and vegetables-E.B.Pantastico, AVI Publishing company, INC
2. Post-harvest technology of fruits and vegetables: handling, processing, fermentation and waste management. Vol I and Vol II Verma L R and Joshi V.K
3. Preservation of fruits and vegetables- Girdharilal, G.S. Siddapa and G.L. Tandon.
4. Fruits and vegetables preservation principles and practices- Srivastava R.P and Sanjeev Kumar

(b) Open-source software and website:

1. **FSSAI (Food Safety and Standards Authority of India)** - <https://fssai.gov.in/> Provides regulations, standards, and guidelines relevant to fruit and vegetable processing in India.
2. **National Horticulture Board (NHB)** - <http://nhb.gov.in/> Offers data and resources on horticultural practices, post-harvest management, and market trends.
3. **Codex Alimentarius** - <http://www.fao.org/fao-who-codexalimentarius/> Contains international standards for food safety and quality, including fruits and vegetables.
4. **Open Food Facts** - <https://world.openfoodfacts.org/> Useful for understanding nutritional values, packaging standards, and microbial spoilage trends in processed food products.
5. **FAO Food Processing Technologies** - <http://www.fao.org/home/en/> Offers resources on fruit and vegetable preservation techniques, machinery, and innovations in food processing.
6. **LibreOffice Calc** - <https://www.libreoffice.org/> An open-source spreadsheet tool useful for documentation and maintenance of records on raw materials, packaging, and final products.

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